BIOS

Alberta Society of Professional Biologists • Fall 2005 Volume 20 • Number 3

Evolving Practices in Environmental Indicators

Environment Canada and Statistics Canada were pioneers in the field, dating back to their State of the Environment (SOE) reporting work in the mid-1980s. Provincial and territorial work in the area of SOE reporting and indicators began in the late 1980s and early 1990s, primarily in response to the work of the World Commission on Environment and Development.

More recently, a number of federal departments, provincial governments, and Canadian communities have been developing indicators on a wide range of issues and at varying scales. All major international environmental institutions, and many multinational economic organizations, have developed indicators.

"the Federation of Canadian Municipalities launched the Quality of Life Reporting System."

Community Level Initiatives

Work on quality of life, healthy communities, and state of the environment reporting in Canadian cities, using a holistic or integrated perspective, began in the mid-1990s. Studies of municipal SOE reporting undertaken by Environment Canada and the Canada Mortgage and Housing Corporation identified more than 900 indicators used at the community level. Of these, 214 were concerned with water, 200 addressed land use issues, and 194 concerned social factors. Other indicators addressed air quality, health, economic factors, natural resources, waste, and energy.

In 1999, the Federation of Canadian Municipalities launched the Quality of Life Reporting System. This Canada-wide community effort (in over 21 cities) monitors changes for ~ 30 indicators of key aspects of quality of life in social, economic, and environmental areas and analyzes the impacts of local, provincial, and national policies.

Regional Level Initiatives

Environment Canada's regional offices, in partnership with other federal departments, provincial and municipal governments, and federal and state agencies in the United States, have developed comprehensive approaches to monitoring and reporting on the state of some major ecosystems including the: Atlantic Coastal Action Plan; St. Lawrence Action Plan; Great Lakes Action Plan; Northern Ecosystem Initiative; Northern Rivers Ecosystem Initiative (now the Western Boreal Ecosystem Initiative); and Georgia Basin Ecosystem Initiative. These ecosystem initiatives vary in structure and design, but all either have or plan to have an indicator and reporting element.

continued on page 6

In This Issue

Evolving Practices in Environmental Indicators . . 1
Member News 2
ASPB Mentoring Program 3
Bios Bits 4
Bios Bits 5
Evolving Practices cont'd 6
National Indicators - Example 7
Evolving Practices concl'd 8

Alberta
Society of
Professional
Biologists
P.O. Box 21104
Edmonton, Alberta
T6R 2V4
Tel: (780) 434-5765
Fax: (780) 413-0076
E-mail: pbiol@aspb.ab.ca
http://www.aspb.ab.ca

President
Robert Dallas (403) 538-4778
President Elect
Bob Holland (708) 452-5878
Secretary
Carol Engstrom (403) 298-6175
Treasurer
Gary Ash (780) 483-3499
Director
Corey De La Mare (780) 930-8633
Director
Maureen Hill (403) 268-5745
Director
Garry Hornbeck (403) 281-3782
Director
Steve Morck (403) 547-2049
Director
Ricardo Moreno (403) 269-4351
Director
Troy Whidden (403) 998-2013
Public Member
Stuart Ross (403) 777-0111
Registrar
Carl Warner (403) 569-6591
Discipline Committee
Brian Bietz (403) 259-6571
Practice Review Committee
Don McCabe (403) 297-5671
Professional Liaison
Rob Powell (780) 422-1977
Executive Director
Robin Leech (780) 452-1311
Professional Development Systems
Robert Dallas (403) 538-4778
Mentoring Program
Carol Engstrom (403) 298-6175
Communications
Maire Luoma (403) 716-8135
Webmaster
Todd McConnell (403) 650-5225
Office Administrator
Jill Lane (780) 434-5765

BIOS is written for the enjoyment of the members of the Alberta Society of Professional Biologists and those interested in the field of professional biology. Articles or comments are welcomed and should be communicated to the ASPB Office. Editing and layout by Gavin More.

WELCOME NEW MEMBERS

Regular: Bruce Barton, Andra Bismanis, Natalie Cooper, Barb Crawford, Wendy Crosina, Nicolas DeGama-Blanchet, Jesse Dunford, Richard Ehlert, Eric Hamelin, Greg Jones, Corey Linnen, Kimberly Pearson, Paul Walker, Coleen Stevens, Marcy Bast, Darrell Jobson, Janice Lorenzana, Christopher Sargent, Jennifer Stone, Clifford Nietvelt, Darcy Meyers, Andrew Forrest, Thomas Gates, Sheila McKeage, Meighan Kearns, Brent Magneson, Kimberly Seifert, Stephen Lines, Michelle Dias

Biologist In Training: Jairo Infante, Ricki-Lynn Boorman, Morgan Lee, Kelly Plaku, Rebecca Ritson-Bennett, Patricia Swan, Maureen Wetsch, Wendy Markowski, Sarah Bigelow, Cara Adrain, Benjamin McWilliams

Student: Tyler Jans, Jill Deschamps, Elise Savard

Membership Update

ASPB membership as of December 1, 2005: Total 597

Regular	488	Biologist in Training	7
Honorary	6	Temporary Withdrawn	20
Student	69	Public Member	1
Associated	6		

ASPB Mentoring Program

It is important for the ASPB membership to clearly understand the reasons why the mentorship program is asking members to commit your valuable time, efforts, and resources toward building the program's success.

Mentoring programs have been institutionalized into the professional framework of "helping" professions such as medicine, social work, education, and nursing for a long time either in the form of practicum settings or internships. Why? The most obvious reason is that these professions have long recognized that, in addition to formal academic training, learning through mentoring programs plays an important part in contributing to the professional growth of their members in an ongoing and comprehensive way. The mentoring programs help these professions to achieve standards of excellence by ensuring that their knowledge base remains the most current, and effective and efficient practices are shared among members to maintain their high levels of professional and personal competencies.

How is learning between academia and mentoring related? Academic environs prepares professionals with the theoretical, practical and ethical foundations of their professions in an objective way primarily through the use of literature and impersonal lectures. In mentoring, however, learning is provided on a more intimate level. The human reservoir possesses a deeper knowledge and practice wisdom that have been

continued on the next page -

Mentoring concluded

developed through the unique trials and tribulations that the mentors have experienced. This wealth of unique knowledge and practice wisdom is characterized by the mentors' professional and personal insights, innovative practices and intellectual evaluation.

This type of learning can be difficult to acquire since it is entirely dependent upon whether people who own it are willing to share their individual knowledge and practice wisdom with others through mentoring. If professional competency is a concern for all involved, a profession's members ought to feel a need to become mentors for the protégés of their discipline who might otherwise be denied the opportunities to access the benefits that are possible from having rich sources of such valuable learning made available to them.

What is the value of Mentoring Programs? Perhaps the three most noteworthy attributes are that a) mentoring programs provide a means for professionals to become mentors for protégés and to institutionalize their knowledge of "lessons learned", b) the learning involved in mentoring programs is not static and unidirectional. Mentoring not only allows mentors to impart their teachings to their protégés, but the nature of mentoring inherently imparts learning to mentors, too, both personally and professionally simply through their interactions with their protégés, and c) the need of professionals to be mentored is not restricted to the early stages of their careers.

This means that, since knowledge is not necessarily related to age, it does not matter whether mentors are older or younger than their protégés so long as mentors can provide the type of mentoring that is needed by their protégés. It also means that someone can both be a mentor for a protege and simultaneously be mentored by someone else.

The ASPB Mentoring Program requires that mentors and protégés remain committed in their participation for at least one year to do justice to the quality of their mentoring relationship. However, they are given latitude in determining for themselves, the frequency of their meetings over the next twelve months.

A mass emailing of registration forms was sent so that a pool list of mentors and a separate pool list of protégés can be established. Members interested in being a mentor, must first read and understand the lists of mentoring benefits, characteristics and responsibilities before completing the mentor registration form. Likewise, protégés will only need to read the lists of protégé benefits, characteristics and responsibilities before completing their protégé registration forms. The matching process of pairing a mentor with a protégé will begin when sufficient names have been received to begin establishing the pool lists of mentors and protégés. People will then be contacted individually about their matching status.

Email completed registration forms to pmraine@telus.net or mail to: ASPB Mentoring Program Coordinator, 2415 Udell Road NW, Calgary, Alberta, T2N 4H4. For more information about the Mentoring Program, please contact me by email or (403) 247-1443 (10:00 am - 5:00 pm weekdays).

Phylis Raine - Program Coordinator

Noah 2005

In the year 2005, the Lord came unto Noah, who was now living in British Columbia, and said, "*Once again, the earth has become wicked and over-populated. Build another Ark and save two of every living thing along with a few good humans. You have six months to build the Ark before 40 days and 40 nights of unending rain.*"

Six months later, the Lord looked down and saw Noah weeping in his yard, but no ark. "*Noah*", He roared, "*Where is the Ark?*"

"*Forgive me, Lord,*" begged Noah. "*But things have changed since the last time. I needed a building permit and I've been arguing with the inspector about the need for a sprinkler system.*

My neighbors claim that I've violated the neighborhood Home Owner's Association zoning laws by building the Ark in my yard and exceeding the height limitations. We had to go to the Planning and Zoning Board for a decision.

Then the Department of Transportation demanded I post a bond for the future costs of moving power, overpasses and other overhead obstructions, to clear the passage for the Ark's move to the sea. I argued that the sea would be coming to us, but they would hear nothing of it.

Getting the wood was another problem. There's a ban on cutting local trees in order to save the spotted owl. I tried to convince the environmentalists that I needed the wood to save the owls. But no go!

When I started gathering the animals, I was sued by an animal rights group. They insisted that I was confining wild animals against their will. As well, they argued the accommodation was too restrictive, and it was cruel and inhumane to put so many animals in a confined space.

Then the Department of Environment, Fisheries and Oceans, and Environmental Assessment Agency ruled that I couldn't build the Ark until they'd conducted an environmental impact study on your proposed flood.

To make matters worse, Customs and Immigration seized all my assets, claiming I'm trying to leave the country illegally with endangered species.

So, forgive me, Lord, but it would take at least ten years for me to finish this Ark."

Suddenly the skies cleared, the sun began to shine, and a rainbow stretched across the sky.

Noah looked up in wonder and asked, "*You mean you're not going to destroy the world?*"

"*No*", said the Lord. "*The Government has beat me to it.*"

Bios Bits

Pathways to Recovery Conference

The proceedings of the Species at Risk 2004 Pathways to Recovery Conference, the result of the fourth conference in British Columbia on species and habitats at risk, are now available.

The conference, held in Victoria in March 2004 was attended by over 1000 scientists, managers, educators, policy makers and legislators from government, First Nations, industry, academia, and non-government organizations.

There are papers and extended abstracts which cover a diverse range of topics including species and habitat ecology, climate change, multi-scale approaches to recovery, setting recovery priorities, recovery planning and implementation, monitoring, stewardship and education. The proceedings are a significant contribution to the science, policy, and stewardship surrounding the recovery of species at risk.

http://www.speciesatrisk2004.ca/html/search.php?all=true

Study List Regulations Change

The Minister of the Environment has announced amendments to the Comprehensive Study List Regulations under the Canadian Environmental Assessment Act that make offshore oil and gas exploratory drilling projects subject to a screening type environmental assessment rather than the current comprehensive study type of assessment. The justification is that the science indicates that the environmental effects of offshore oil and gas exploratory drilling are, in general, minor, localized, short in duration and reversible.

A screening is a systematic review that examines the environmental effects of a proposed project including its cumulative effects, and also establishes methods for minimizing any effects. If significant effects or public concerns are identified during a screening, the Minister has the option of referring the project to a review panel.

While oil and gas explorations in the offshore will, from now on, be subject to a screening, there are no changes to the comprehensive study requirements for offshore production facilities and offshore pipelines, including associated public consultations and participant funding.

The amendment was published in the Canada Gazette, Part II on November 30, 2005.

Consolidation of Federal Environmental Assessment

Collectively, more than 30 federal authorities assess about 6,000 projects per year. The government spends about $65 million per year to assess projects worth billions of dollars. In some situations, it can take several months for federal departments to agree on the determination of a project to be assessed, who should lead the assessment or what type of assessment is required. This can have a negative effect on Canada's investment climate and leave interested Canadians frustrated as their opportunities for getting involved are delayed or unclear.

The Minister of the Environment recently announced an action plan to consolidate the federal environmental assessment process. The first part of this action plan consists of a Cabinet Directive, taking effect immediately, that sets out the expectations of Ministers with respect to implementation of the Canadian Environmental Assessment Act.

The Directive reinforces the Canadian Environmental Assessment Agency's leadership role and instructs the Agency and federal authorities on how they should conduct themselves to deliver high quality environmental assessments in a timely and predictable manner. The Directive establishes common principles for determining what will be examined in a federal environmental assessment, clarifies who is responsible for ensuring implementation of mitigation measures to prevent significant adverse effects and provides for involvement of senior officials to ensure a coordinated federal process.

A discussion paper for public consultation on options for legislative amendments will be made public soon. Following these consultations, a bill will be tabled in the House of Commons.

DFO Proposes Additional Aquatic Species

Fisheries and Oceans Canada has proposed to add three aquatic species to the list of species protected under the Species at Risk Act (SARA) including the Scotian Shelf population of the Northern bottlenose whale (endangered), the channel darter (threatened) and Interior Fraser River coho salmon (endangered).

Six species assessments will be returned to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) for further information or consideration including: Atlantic cod (Arctic population), cusk, bocaccio, harbour porpoise (NW Atlantic population), Lake Winnipeg physa, and shortjaw cisco to allow the opportunity to incorporate Aboriginal Traditional Knowledge where needed.

DFO announced that Atlantic cod (Newfoundland & Labrador, Laurentian North and Maritimes) will not be added as this would have high social and economic impacts on many persons in coastal communities - listing cod could cost fishers and processors up to $82 million a year in gross revenue.

Bios Bits

See www.dfo-mpo.gc.ca/media/backgrou/2005/species_e.htm for additional background information.

The recommendations will be published in the Canada Gazette, Part 1, on December 10, 2005. Canadians will have 30 days to provide further comments or concerns. A final decision on adding this set of species to SARA will be made by Cabinet by April 2006.

Mikisew vs Canada

Under Treaty 8, made in 1899, the First Nations surrendered to the Crown 840,000 sq km of what is now northern Alberta, northeastern British Columbia, northwestern Saskatchewan and the southern portion of the Northwest Territories. Under Treaty 8, the Mikisew Cree, among others, were promised reserves and some other benefits including, most importantly to them, the rights to hunt, trap and fish throughout the land surrendered to the Crown except "*such tracts as may be required or taken up from time to time for settlement, mining, lumbering, trading or other purposes*" in exchange for the surrender.

One of these bands inhabit the Mikisew Reserve within what is now Wood Buffalo National Park. In 2000, the federal government approved a winter road, which was to run through the Mikisew's reserve, without consulting them. After the Mikisew protested, the road alignment was modified (but without consultation) to track around the boundary of the reserve. The Mikisew's objection to the road goes beyond the direct impact of closure to hunting and trapping of the area covered by the winter road and included the injurious affection it would have on their traditional lifestyle which was central to their culture.

The Federal Court, Trial Division set aside the Minister's approval based on breach of the Crown's fiduciary duty to consult with the Mikisew adequately and granted an interlocutory injunction against constructing the winter road. The court held that the standard public notices and open houses which were given were not sufficient and that the Mikisew were entitled to a distinct consultation process.

The Federal Court of Appeal set aside the decision and found, on the basis of an argument put forward by an intervener (Alberta Government), that the winter road was properly seen as a "taking up" of surrendered land pursuant to the treaty rather than an infringement of it. This judgment was delivered before the release of the decisions in the landmark Haida Nation and Taku River Tlingit First Nation cases in British Columbia..

In the Mikisew case, the Supreme Court of Canada found that adequate consultation in advance of the Minister's approval did not take place. The court decided that the the Minister's approval should be quashed, and the matter returned to the Minister for further consultation and consideration.

The basis for the decision is that the fundamental objective of the modern law of aboriginal and treaty rights is the reconciliation of aboriginal people, and non-aboriginal peoples and their respective claims, interests and ambitions.

In the case of the Mikisew, the duty of consultation which flows from the honour of the Crown, and its obligation to respect the existing treaty rights of aboriginal peoples (now entrenched in s. 35 of the Constitution Act, 1982), was breached. The Crown, while it has a treaty right to "take up" surrendered lands, is nevertheless under the obligation to inform itself on the impact its project will have on the exercise by the Mikisew of their treaty hunting, fishing and trapping rights and to communicate its findings to the Mikisew.

The court stated that the Crown is required to provide notice to the Mikisew and to engage directly with them. This engagement should include the provision of information about the project, addressing what the Crown knew to be the Mikisew's interests and what the Crown anticipated might be the potential adverse impact on those interests. The Crown must then attempt to deal with the Mikisew in good faith and with the intention of substantially addressing their concerns.

Conserving Woodland Caribou in Alberta

Alberta will implement a series of actions to add a greater level of protection for woodland caribou, a species regarded as "threatened" in the province.

Many of these new steps are based on the Alberta Woodland Caribou Recovery Plan [download the plan at http://www3.gov.ab.ca/srd/fw/speciesatrisk/pdf/final_caribou_recovery_plan_photo_cover_July_12_05.pdf].

Caribou will now be managed within five large landscape-planning areas, each containing several caribou populations. Alberta has established a single Alberta Caribou Committee, with government, industry and stakeholder representatives, to coordinate management activities. Five caribou landscape planning teams will focus on specific landscape challenges and strategies.

The province will engage aboriginal people regarding caribou recovery and promote industry best practices more widely to companies operating on all caribou ranges.

Plans also include a short-term, selective predator management program where necessary.

The province will continue discussions on national caribou management and recovery with other governments.

Evolving Practices continued

Provincial / Territorial Level Initiatives

Different provinces and territories have moved in different directions with their reporting and indicators activities. The first provincial "state of environment" reports were issued in Quebec (1988), Saskatchewan (1991), Manitoba (1991), British Columbia (1993), Alberta (1994), and the Yukon (1996). Most have a comprehensive reporting element of their program, but many separate the publishing of reports into thematic reports that are prepared in between the comprehensive overviews.

In British Columbia and several other jurisdictions, the comprehensive SOE report has been followed by more focused indicator reports; in the future, these may be published alternately with in-depth sectoral reports. Many continue to work toward making an effective link between interpretation, indicators, and data, and by raising public awareness and developing indicators specifically linked to policy needs.

Federal and Intergovernmental National Level Initiatives

Large and comprehensive national SOE reports previously produced every five years have given way to periodic issue reports (e.g., Nutrients in the Canadian environment) through Environment Canada and other natural resource departments, and shorter, indicator-based national reports, such as Environmental signals.

The National Environmental Indicator Series (reported on through two Environmental Signals 2003 reports) provides a national profile of the state of Canada's environment and measures progress towards sustainable development. Environmental Signals 2003 reported on 55 environmental indicators for 13 key environmental issues.

The Canadian Council of Forest Ministers' Criteria and Indicators of Sustainable Forest Management in Canada reports regularly on progress in achieving sustainable forest management through the development and implementation of national indicators that incorporate environmental, social, and economic dimensions.

Statistics Canada has adopted a natural capital approach to indicators in its Econnections information system, using indicators such as natural resource wealth, physical quantities of natural resource assets, and total resource base. The agency's Human activity and the environment series of reports, published every five years, brings together environmental statistics from many sources and explores the relationships between the country's natural systems (air, water, soil, plants, and animals) and the human activities that affect them.

"Statistics Canada has adopted a natural capital approach to indicators in its Econnections information system"

Agriculture and Agri-Food Canada uses 14 indicators in 6 areas: farm resources management; soil degradation risk; risk of water contamination; agricultural greenhouse gases; agro-ecosystem biodiversity, and agricultural production efficiency.

The National Round Table on the Environment and the Economy recently recommended the regular reporting of the following five environmental indicators:

- forest cover: tracking the change of the percentage of Canada's total ground area that is covered by forests;
- extent of wetlands: tracking the change of the percentage of Canada's total ground area that is covered by wetlands;
- air quality indicator: population-weighted measure of exposure to ozone;
- freshwater quality indicator: national sample of the state of water quality; and
- greenhouse gas emissions: national total annual emissions of greenhouse gases.

International Level Initiatives

SOE reporting and indicator development are now internationally endorsed and promoted as key components to effective environmental policy and sustainable development strategies. Reporting on the achievement of environmental outcomes or compliance with environmental regulation is often a component of international agreements as well as collaborative efforts, including the Convention on Biological Diversity and the Organisation for Economic Co-operation and Development.

Comprehensive SOE reports issued by many international organizations include current status, trends, and perceptions regarding Environmental Indicators.

In general, indicators used by multilateral organizations consistently address similar issues: air quality, climate change, water quality, forestry, agriculture, waste, and biodiversity. There also are similarities among the indicators used in these common issue areas. Some are the same (e.g., greenhouse gas emissions), while others vary slightly in detail. Canada is a partner to more than 50 bilateral and multilateral environmental agreements that commit Canada to "sharing information" or "reporting on progress" in a particular area.

Current Status and Trends

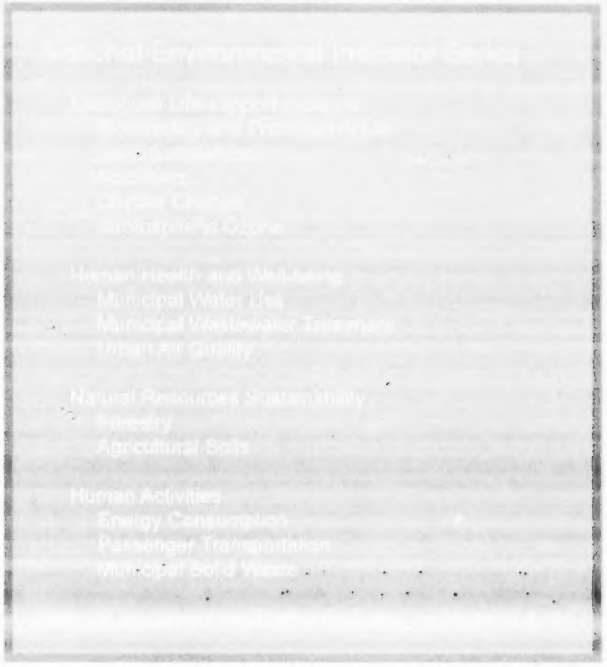
The development of environmental indicators is a "growth industry" in

concluded on page 8

National Indicators - Example

Environmental indicators provide an effective means by which complex environmental data can be transformed into easy-to-use communication tools that track the state of the environment and measure progress towards sustainable development.

The National Environmental Indicator Series, provides a broad picture of the current state of Canada's environment, as well as the linkages between issue areas. Each issue area is structured in terms of the human activities that act as pressures on the environment, the condition of the environment, and societal responses to address the issue. A brief selection of national and international actions that deal with each environmental issue are provided. The report concludes with a look at what decisions individual Canadians can make to live more sustainably and the challenges and opportunities related to continuing indicator development in Canada.



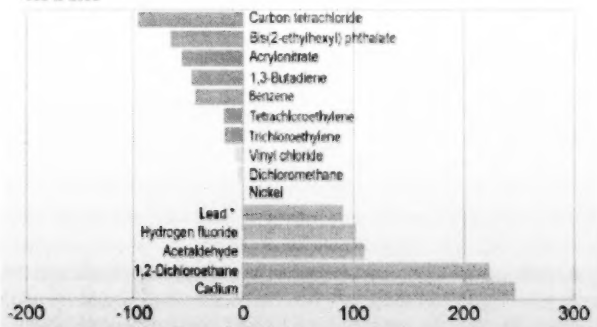
Example - Toxic Sustances

Approximately 23,000 existing substances currently approved for use in Canada are being reviewed to determine if they are toxic or capable of becoming toxic. Fifty-two of these substances are defined as toxic by the Canadian Environmental Protection Act, 1999 (CEPA 1999). A substance is toxic if it enters the environment in a quantity that has or may have a harmful effect on the environment or human health.

The number of substances on the CEPA List of Toxic Substances has grown as progress has been made in assessing existing and new substances. When CEPA was first passed in 1988, there were 9 substances on the List. In 2002, there are 52. Once a substance is placed on the list, management strategies are developed and implemented to control its release into the environment. Reliable matched data from 1995 to 2000 are available for 15 toxic substances.

Change in emissions of toxic substances variable

Percent change in emissions of 15 CEPA toxic substances with matched data from 1995 to 2000



Data source: National Pollutant Release Inventory, Environment Canada.
Adapted by: National Indicators and Reporting Office, Environment Canada.

There has been important progress made towards reducing emissions of a number of toxic substances. For example, mercury emissions to air saw an overall decrease of 77% from 1990 to 2000. Emissions were reduced primarily from incineration operations as well as the steel and primary base metals sectors.

The CEPA includes effective and flexible provisions for preventing pollution, controlling toxic substances, managing wastes, and preventing and addressing environmental emergencies. The Act provides clear objectives for assessing new and existing substances and managing risks through a wide range of measures, including codes of practice, guidelines, pollution prevention plans, economic instruments, and regulations.

Current initiatives underway include the Toxic Substances Research Initiative and the Toxic Substances Management Policy which sets out two tracks for the management of toxic substances: virtual elimination and life cycle management. The NPRI provides Canadians with access to information on key sources of pollution in their communities. The National Air Pollution Surveillance (NAPS) program collects data on the components of smog, and can help identify links between air pollution and human health. The Northern Contaminants Program is reducing or eliminating contaminants in high-risk foods harvested in Canada's North.

For the full National Indicators visit: www.ec.gc.ca/soer-ree/English/Indicator_series/default.cfm

Evolving Practices concluded

Canada and internationally. The past decade has seen a rapid expansion in both the number of indicators and the number of organizations at all levels of government undertaking indicators and reporting work. At the same time, the focus of these indicators has been narrow. The 865 indicators identified for Canadian and bilateral initiatives in which Canada is a partner cover 12 issues. Of the 865 indicators, 546 (63%), are focused on five issues - biodiversity, "drivers" (includes population, economy, energy, and transportation), resource use, climate change, and water. One issue alone, biodiversity, accounts for 17% of the total number of indicators in all the Canadian and bilateral initiatives.

The world-wide growth in indicator and reporting programs has generated a number of very different approaches or frameworks. These include:

- Pressure-State-Response Framework - remains the most common model used for indicator work based on environmental monitoring.
- Natural Capital Model - based on economic surveys and environmental monitoring to provide monetary estimates of the full range of tangible and intangible uses and values relating to the environmental resource base, including, for example, water quality, air quality, biodiversity, and a stable climatic system.
- Multiple Exposures Multiple Effects Model - developed by the World Health Organization to more accurately reflect the underlying science, the complex relationships among forces of change and response.
- Criteria and Indicators for Sustainable Forestry Framework - is based on environmental, economic, and social values. There are 6 criteria, 22 elements, and 83 indicators within the criteria and indicators framework, and it is used to measure the condition of forests and report on Canada's progress towards sustainability.
- Results Management Accountability Framework - are the Treasury Board Secretariat's indicators of environmental performance to measure progress in federal departments to assess the degree of achievement of program results.

State of the Environment Reports have long used a variety of frameworks or organizing principles, often in combination. Among others, these have included: issues (climate change, urban sprawl), human activities (agriculture, tourism), themes (air, water, land, biodiversity), and geography (including reporting by ecological frameworks). Though rare, some environmental indicator studies, such as the Georgia Basin-Puget Sound report, feature a set of indicators selected on the basis of particular criteria.

Taking Stock - Re-thinking Indicators

It is time to re-think the roles of environmental indicators and state of the environment reporting. Environmental indicators have traditionally been described as "early warning signals" for emerging environmental concerns. Experience indicates that the role of indicators is not the proverbial "canary in the coal mine"; that task more properly falls to basic science. In the past, scientists have consistently called attention to emerging concerns. By the time that data are available and work on indicators has begun on a particular environmental concern, that concern is high on the list of priorities for the public and policy-makers alike.

There is growing recognition that indicators and reporting must become more relevant to the needs of policy-makers for timely, understandable information. With some exceptions, indicators developed by one region or group have tended to be driven by data availability, rather than by user needs. Policy-makers are looking for tools that can help monitor and measure progress against stated objectives. Indicators should link to performance measures so that they can help track progress on environmental action and promote accountability. There is a need for a nationally consistent picture of environmental health, and for research and development of innovative reporting tools.

Future Challenges

- Environment-economy linkages: The use of environmental information to support and evaluate economic policies is increasing the demand for credible and timely information.
- Environment-human health linkages: Indicators and reporting are only beginning to catch up to the demand for ways to understand the linkages between environmental changes and human health.
- Emerging environmental challenges: Important environmental concerns are emerging for which little or no indicators work has yet been undertaken.
- Changing role of government: A renewed emphasis on good governance is putting a premium on demonstrating accountability, working through partnerships, and fulfilling international agreements.

Source: Extracted from "Current Status, Trends, and Perceptions regarding Environmental Indicators and State of the Environment Reporting in Canada". Background paper to an Environmental Indicators and State of the Environment Reporting Strategy, 2004-2009, Environment Canada.

A companion report provides background information on provides an easy reference on indicator and reporting initiatives across Canada and internationally, including website links. Included are tables providing details on international agreements to which Canada is a legal party, and bilateral and multilateral relations for North and South America to which Canada is a signatory. It is an extremely useful reference for anyone interested in indicators.

www.ec.gc.ca/soer-ree/English/resource_network/bg_paper1_e.cfm.